

## OLIVER HEAVISIDE—HUMORIST.

BY

C. M. HEBBERT, Ph.D.

Bell Telephone Laboratories, New York, N. Y.

*Heaviside Layer*, *Heaviside's Expansion Theorem* and *Heaviside's Operational Calculus* are commonly heard phrases which do not sound like the writings of their author would constitute source-books of humor. He would not indeed have been featured in a Sunday evening radio comedian's hour, but scattered here and there through his papers filled with long equations and weighty discussions of basic electrical questions are sentences or paragraphs or whole sections revealing a vast knowledge of the lighter modes of expression and a large appreciation of the homely phrase and its power to carry home a point. He even proposed semi-seriously that the name "Heavy" should be used for loading, saying<sup>1</sup> "The *side* should be omitted. I never suffered much from it; they said it was swelled head. *Heavify* and *Heavification* seem to me the best."

Coining names apparently gave him especial pleasure but he was careful to explain why he liked his choice. In the first of a series of Notes on Nomenclature<sup>2</sup> published in *The Electrician* in 1885 and 1886, with the title "Ideas, Words and Symbols," he discussed the pros and cons of names like resistivity, conductivity, permeability, capacity, etc. This note ends by saying "All these things will get right in time perhaps. Ideas are of primary importance, scientifically. Next, suitable language. As for the notation, it is an important enough matter, but still only takes the third place." Then, Note 2, "On the Rise and Progress of Nomenclature," starts off: "In the beginning was the word. The importance of nomenclature was recognized in the earliest times. One of the first duties that devolved upon Adam on his installation as gardener and keeper of the Zoological Collection was the naming of the beasts. Passing over the patriarchal period, the fall of the Tower of Babel and its important effects on nomenclature . . . , and coming at once to the middle of the 19th Century, we find that Mrs. Gamp<sup>3</sup> was much impressed by the importance of nomenclature. 'Give it a name, I beg. Sairey, give it a name!' cried that esteemed lady. She even

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<sup>1</sup> Katherine Maynard, "Oliver Heaviside as Seen in his Books and Letters." *The Technology Review*, March, 1933.

<sup>2</sup> Electrical papers, Vol. II, pp. 23-28.

<sup>3</sup> Mrs. Sairey Gamp, midwife and nurse, was a Character in Dickens' novel "Martin Chuzzlewit."

went so far as to give a name to an entirely fictitious personage—Mrs. Harris, to wit—who has many scientific representatives.”

“Having thus fortified ourselves by quoting both ancient and modern instances, let us consider the names of the electrical units. A really practical name should be short. . . . If, in addition it be the name or part of the name of an eminent scientist, so much the better. This is quite a *sentimental* matter; but if it does no harm, it is needless to object to it.”

“Ohm and volt are admirable; farad is nearly as good (but surely it was unpractical to make it a million times too big—the present microfarad should be the farad); erg and dyne please me; watt is not quite so good, but is tolerable. But what about those remarkable results of the Paris Congress, the ampere and the coulomb? Speaking entirely for myself they are very impractical. Coulomb may be turned into coul and is then endurable; this unit is, however, little used. But ampere shortened to am or amp is *not nice*. Better make it *pere*. . . . Was not Ampere the *father* of electrodynamics?”

“Mac, Tom, Bob and Dick are all good names for units. Tom and Mac (plural, Max) have sentimental reasons for adoption; Bob and Dick may also at some future time. . . . We have much to be thankful for. Consider what frightful names<sup>4</sup> might have been given to the electrical units by the Germans.”

In Note 4 on nomenclature (1887) he speaks of “This eminent *scienticulist*<sup>5</sup> who “once declared that  $E = RC$ , to express Ohm’s law, was nonsense; it must be  $C = E/R$ . . . . It is for the practitioners to find practical ways of getting a round peg to fit a square hole.”

He must have had a fine time writing the opening paragraph of a paper<sup>6</sup> on “The Earth as a Return Conductor,” which follows:

“The daily newspapers, as is well known, usually contain in the autumn time paragraphs and leaders upon marvelous subjects which at other times make way for more pressing matter. The sea-serpent is one of these subjects. This year, however, that interesting animal has not been so observable, which is, perhaps, the reason why an equally wonderful and not less time-honored phenomenon has come to the fore again. There appeared lately an account of the performance of ‘an innocent boy’ with a stick of wood, which, being held in the hands of the operator as he walked about in a field, twisted and turned itself so as

<sup>4</sup> *The Scientific American*, Vol. 36 (Feb. 2, 1878), p. 68, “one inventor collecting all his energies for one grand effort, triumphantly produced ‘doppelstahlblechzungen sprecher.’ The jaw can be replaced by pressing on the lower molars with the fingers, and guiding the muscles with the thumbs.” But, a few pages earlier in the same volume a Philadelphian proposed the name “belophone.”

<sup>5</sup> The word “scienticulist” appears again on p. IV of the preface to Vol. II, of “Electromagnetic Theory.”

<sup>6</sup> *Elect. Papers*, Vol. I, p. 190.



to prove the existence and point out the situation of water beneath the surface. This may or may not be. Never having studied the action of divining rods makes me an incompetent judge; but on further reading the explanation of a philosopher<sup>7</sup> of the cause of the phenomenon, viz., that the water was a conductor of electricity, and therefore, the electric currents deflected the wand, I was at once reminded (perhaps strangely, for there is hardly any connection between the theories) of a theory of the action of the earth as a return conductor that I first read some fifteen years ago in a Handbook which has since passed through many editions."

Sometimes his humor carries a barb as in Electrical Paper No. XXIII (Vol. II, p. 28), where he carries on a feud with Prof. Hughes beginning with "We read in the pages of history of a monarch who was '*supra grammaticum*.' All great men are like that monarch. They have their own grammars, syntaxes and dictionaries. No man has a more peculiar grammar than Prof. Hughes. . . . I took great pains in translating Prof. Hughes' language into my own."

About grammar in general he had ideas of his own, expressed as follows:<sup>8</sup> ". . . some critic has made etymological objections. But what has etymology got to do with it? The proper place for etymology is the grammar book. I always hated grammar. The teaching of grammar to children is a barbarous practice, and should be abolished. They should be taught to speak correctly by example, not by unutterably dull and stupid and inefficient rules. The science of grammar should come last, as a study for learned men who are inclined to verbal finnick. Our savage forefathers knew no grammar. But they made far better words than the learned grammarians. Nothing is more admirable than the simplicity of the old style of short words, as in A sad lad, A bad dog, of the spelling book. If you transform these to A lugubrious juvenile, A vicious canine, where is the improvement?"

One article of a long series (XXXV in Elect. Papers) has the title "The Transfer of Energy and its Application to Wires." But he starts out with a gentle ribbing of a learned contemporary:

"When a sage sits down to write an elementary work he naturally devotes Chapter I to his views concerning the very foundation of things, as they present themselves to his matured intellect. If may be ques-

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<sup>7</sup> Regarding the term philosopher see the introduction to "Electromagnetic Theory," Vol. I, p. 5: "For my part I always admired the old-fashioned term 'natural philosopher.' It was so dignified and raised up visions of the portraits of Count Rumford, Young, Davy, etc., usually highly respectable looking elderly gentlemen, with very large bald heads and much wrapped up about the throats, sitting in their studies pondering calmly over the secrets of nature revealed to them by their experiments. There are no natural philosophers now-a-days. How is it possible to be a natural philosopher when a Salvation Army band is performing outside; joyously, it may be, but not most melodiously? But I would not disparage their work; it may be far more important than his."

<sup>8</sup> "El. Th.," Vol. I, p. 404.

tioned whether this is to the advantage of the learner, who may be well advised to 'skip the Latin,' as the old dame used to say to her pupils when they came to a polysyllable, and begin at Chapter II. If this be done, Prof. Tait's 'Properties of Matter' is such an excellent scientific work as might be expected from its author. But Chapter I is metaphysics. There are only two Things going, Matter and Energy. Nothing else is a thing at all; all the rest are Moonshine, considered as Things."

Further on—"it is like this. If a person is in a room at one moment, and the door is open, and we find that he is gone the next moment, the irresistible conclusion is that he has left the room by the door. But he might have gone under the table. If you look there you can make sure. But if you are prevented from looking there, then there is clearly a doubt whether the person left the room by the door or got under the table hurriedly. There is a similar doubt in the electromagnetic case in question, and in other cases."

After deriving some formulas for "self-induction" of a wire of rectangular cross-section he points out some errors in an equation given by Thomson and Tait and remarks "Such little errors will find their way into mathematical treatises; there is nothing astonishing in that; but a certain collateral circumstance renders the errors in their equation worthy of being long remembered. For the distinguished Authors pointedly call attention to the astonishing theorems *in pure mathematics* to be got by the exchange of  $a$  and  $b$ , such as rarely fall to the lot of pure mathematicians. They were miraculous!"

Tilting with the mathematicians occupied a great deal of space in his articles because his unorthodox methods were frequently so sketchily explained as to shock the conservative rigorists of that time. But he says<sup>9</sup> "Even Cambridge Mathematicians deserve justice. . . . We must take the good with the bad, in this as in other matters; and though legitimate and serious objection may be raised to the distressing and soul-destroying style in which some Cambridge mathematicians do their work, and to the unpractical conservative tendency that exists . . . , we should also bear in mind the great volume and value of the work done, and not unduly depreciate or make invidious comparisons.—Now, it has come to my knowledge that a man who is not a Cambridge Mathematician and who does not pretend to be much of any sort of mathematician, but who is a practical physicist—recently made the discovery that a certain unconventional mode of treating the mathematics of the question (explained to him by myself) conducted him immediately to the exact solution of the problem he had in hand (on

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<sup>9</sup> "Mathematics—and Mathematics." Remarkable phenomenon—"Electromagnetic Theory," Vol. II, pp. 10-12.



the age of the earth). Of course, he has no prejudices<sup>10</sup> of the rigorous kind; but makes use of what he finds useful, as soon as he has gotten to know how to go to work.—For this reason, I shall have no further hesitation in making use of the method—in the course of this work, at least in such simple cases as the above experience shows are fairly and without much trouble within the reach of practical physicists and electricians; not mathematicians of the Cambridge or Conservatory kind, who look the gift-horse in the mouth and shake their heads with solemn smile, or go from Dan to Beersheba and say that all is barren; but of the common field variety, who take the seasons as they come and go, with grateful appreciation.” In a later paper<sup>11</sup> he remarked concerning the use of operators in the solution of differential equations, “The matter has a great future—as academical mathematicians will find out in time, if they live long enough.”

Some lines<sup>12</sup> regarding certain surprising results sound like copy for present-day propagandists. “The human mind is so made as to be capable of believing anything, no matter how silly, provided it is imprinted heavily enough. This is well known to all astute people—to those priests in particular who convert men and women into sheep by saying the same thing over and over again.—The incredibility of results is no evidence by itself of necessary error. The reasoning man may not believe till he sees it; that does not imply disbelief, but a reserved attitude waiting for more light.”

Sometimes it took quite a while to get his sense of humor working when the shoe was on the other foot, as he admits in a parenthetical paragraph<sup>13</sup> as follows: “(—For the benefit of the uninitiated, I should explain that *El. Pa.* means my ‘Electric Papers.’ They can be picked up cheap, because the remainder was sold off in quires for a few pence per volume, on account of the deficiency in storage room. So look in the four-penny boxes. Though somewhat vexed at first by this disposal of my laboured lucubrations, it has, later, given me and others occasion for much laughter).”

Sir Oliver Lodge was among the earliest to appreciate Heaviside's work. In a footnote to a lecture<sup>14</sup> given at the Royal Institution on the evening of March 8, 1889, he says “And of one whose name is not yet on everybody's lips, but whose profound researches into electro-magnetic waves have penetrated further than anybody yet understands into the

<sup>10</sup> This idea appears again in a paper “On Operational Methods in Physical Mathematics” (*Roy. Soc.*, Feb. 1893), “and, as regards the following brief sketch, however imperfect it may be, it has at least the recommendation of having been worked out in a mind uncontaminated by the prejudice engendered by prior knowledge acquired at second hand: I do not say it is the better for that, however.”

<sup>11</sup> “Electromagnetic Theory,” Vol. III, p. 207.

<sup>12</sup> *Electrician*, Vol. 45 (1900), p. 445.

<sup>13</sup> *Electrician*, Vol. 46 (1901), p. 866.

<sup>14</sup> “Modern Views of Electricity” (1889), p. 372.

depths of the subject, and whose papers have very likely contributed partly to the theoretical inspiration of Hertz—I mean that powerful mathematical physicist, Mr. Oliver Heaviside.” Lodge carried this admiration to the end and was invited by the editor of the *Electrician* (in which so much of Heaviside’s work had been published) to write an account<sup>15</sup> of his life and work just after Heaviside’s death in 1925. After giving a resumé of important contributions Lodge wrote:

“Heaviside had, however, a peculiar vein of humour, and sometimes his writings amused, even though they did not edify. . . . The peculiarity of his modes of expression rather alienated, for a time, and perhaps even to this day, the majority of Cambridge mathematicians; for, though there is much originality, there is little orthodoxy in his manner of presentation.”

In spite of this “little orthodoxy,” it now appears that the Editor of the *Electrician*<sup>16</sup> spoke truly when he said:

“A chapter is closed; but a new chapter is opened. Among much uncertainty nothing is surer than that Heaviside’s name will live for evermore in the gallery of scientific heroes.”

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<sup>15</sup> Lodge, “Oliver Heaviside. An Appreciation: The Personal Equation: The Work of a Genius Elucidated.” *Electrician*, Vol. 94 (Feb. 13, 1925), pp. 174–5.

<sup>16</sup> *Ibid.*, p. 172.